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May 18, 2012

Ms. Marlene H. Dortch  
Secretary to the  
Federal Communications Commission  
Washington, D.C. 20554

Re: *Ex Parte* Communication-Wireless E911 Location Accuracy  
Requirements-PS Docket No. 07-114

Dear Ms. Dortch:

Yesterday, on behalf of TruePosition, Inc., Rob Anderson, Senior Vice President and Chief Technology Officer, Rashidus Mia, Senior Vice President and Chief Scientist, Michael Amarosa, Senior Vice President and I met with the Commission's staff regarding the above proceeding. Participating were David Furth, Henning Schulzrinne, Thomas J. Beers, Zenji Nakazawa, Patrick Donovan, David Siehl, Jerome Stanshine and Aaron Garza. In these discussions TruePosition urged the Commission to apply its wireless location accuracy rules to indoor environments. TruePosition detailed recent testing it performed that indicated the critical need to improve E 911 location accuracy and recommended a path to more meaningful indoor location capability. A document detailing the discussion is attached.

Respectfully,

A handwritten signature in blue ink, appearing to read "John E. Logan".

Attachment

Copy to: Mr. Furth, Mr. Schulzrinne, Mr. Beers, Mr. Nakazawa, Mr. Donovan, Mr. Siehl, Mr. Stanshine and Mr. Garza



Indoor Location Accuracy Requirements  
Ex Parte Presentation  
Federal Communications Commission  
PS Docket 07-114  
May 16, 2012

- Location of Indoor 911 calls is a real and growing problem
- Proven solutions exist today to solve this problem
- FCC should act now to close this gap in the current rules

# A Real and Growing Problem

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- Ovum forecasts the number of wireless subscribers in the US to be 358 million in 2012. By 2016, the number of wireless subscribers will grow to 425 million.
- According to the CTIA, over 296,000 wireless calls are made to 9-1-1 every day.
- According to the FCC, it is estimated that about 70 percent of 9-1-1 calls are placed from wireless phones, and that percentage is growing.
- According to the FCC, one quarter of all households have now stopped their landline service and solely use cell phones to communicate.

# A Real and Growing Problem

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- In a 2010 study, the National Health Interview Survey (NHIS) indicated that the number of American homes with only cell phones continues to grow.
  - More than half of adults aged 25–29 years (51.3%) live in households with only cell phones.
  - Nearly half of all adults renting their home (47.1%) had only cell phones.
  - Nearly one of every six American homes (15.9%) makes all or almost all calls on cell phones despite having a landline.

# A Real and Growing Problem

- States report (Alabama, Texas, Virginia, Washington, Massachusetts, Delaware, and Michigan) that percentage of wireless calls range from 52% to 72% of all calls received by PSAPs
- J.D. Power 2009 study shows that 52% of all wireless calls are made indoors
- Verizon states the percentage of indoor wireless 911 calls (20%) is lower than indoor wireless call overall. [*Ex Parte Letter of Robert Morse, Esquire on behalf of Verizon and Verizon Wireless, PS Docket No. 07-114 (July 23, 2010)*]
- Even if we consider this lower estimate of 20%, that implies more than **2 million indoor wireless 911 calls each month**; this is more than **all** wireless 911 calls when E-911 Phase II rules were originally initiated.

- Testing conducted in conjunction with a major wireless carrier
- Goals:
  - Demonstrate Accurate UTDOA locations for UMTS mobiles
  - Demonstrate value of Hybrid (AGPS/UTDOA) Solution
- Test Methods:
  - 5 Indoor Test Points
  - 10 Outdoor Test points (5 of which were near the indoor test points)
  - Used standard off-the-shelf handsets
  - Dialed 911 (configuration in switch directed call to voice response system)
  - ~50 Test calls at each point, each call produce AGPS and UTDOA location
    - AGPS location on computed by handset and returned to network
    - UTDOA location computed by the network
    - Hybrid location computed offline based on reported Lat/Lon and Uncertainty of each technique

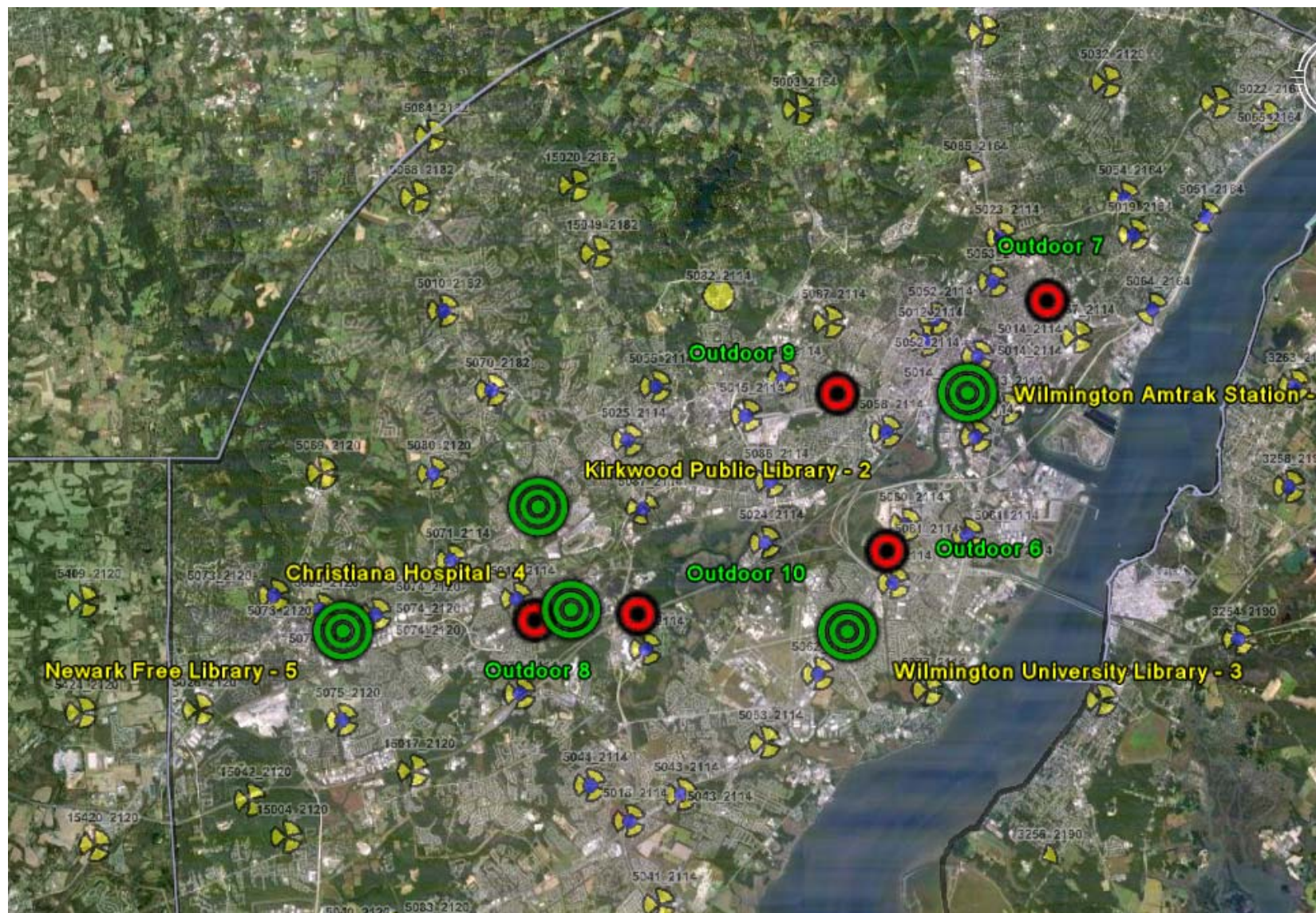
# Indoor Test Point Buildings

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- **Wilmington Amtrak Station**
  - 2 story brick structure near downtown
  
- **Newark Free Library**
  - Single story stucco and glass in residential area
  
- **Wilmington University**
  - 2 story brick building similar to others in the area
  
- **Christiana Hospital Cafeteria**
  - Centrally located in large Hospital complex
  
- **Kirkwood Library**
  - 3 story glass and steel building in residential neighborhood



# Test Point Map

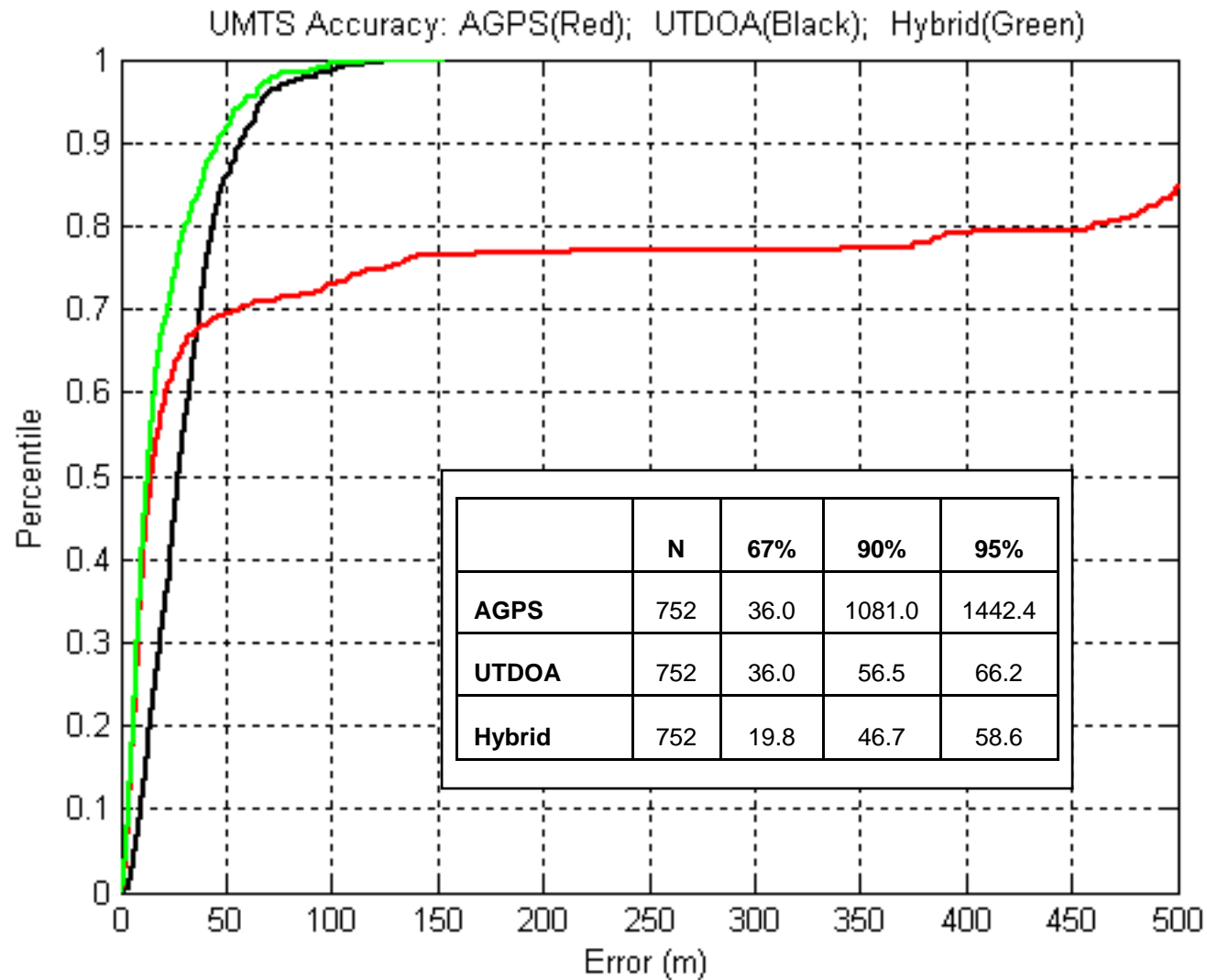


# Call Statistics

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- AGPS/RTT Locations – 752 locations total
  - 533 AGPS Solutions (71%)
  - 211 RTT Solutions
  - 8 Cell ID Solutions
  
- UTDOA Locations – 752 locations total
  - All 752 Locations produced a UTDOA Solution

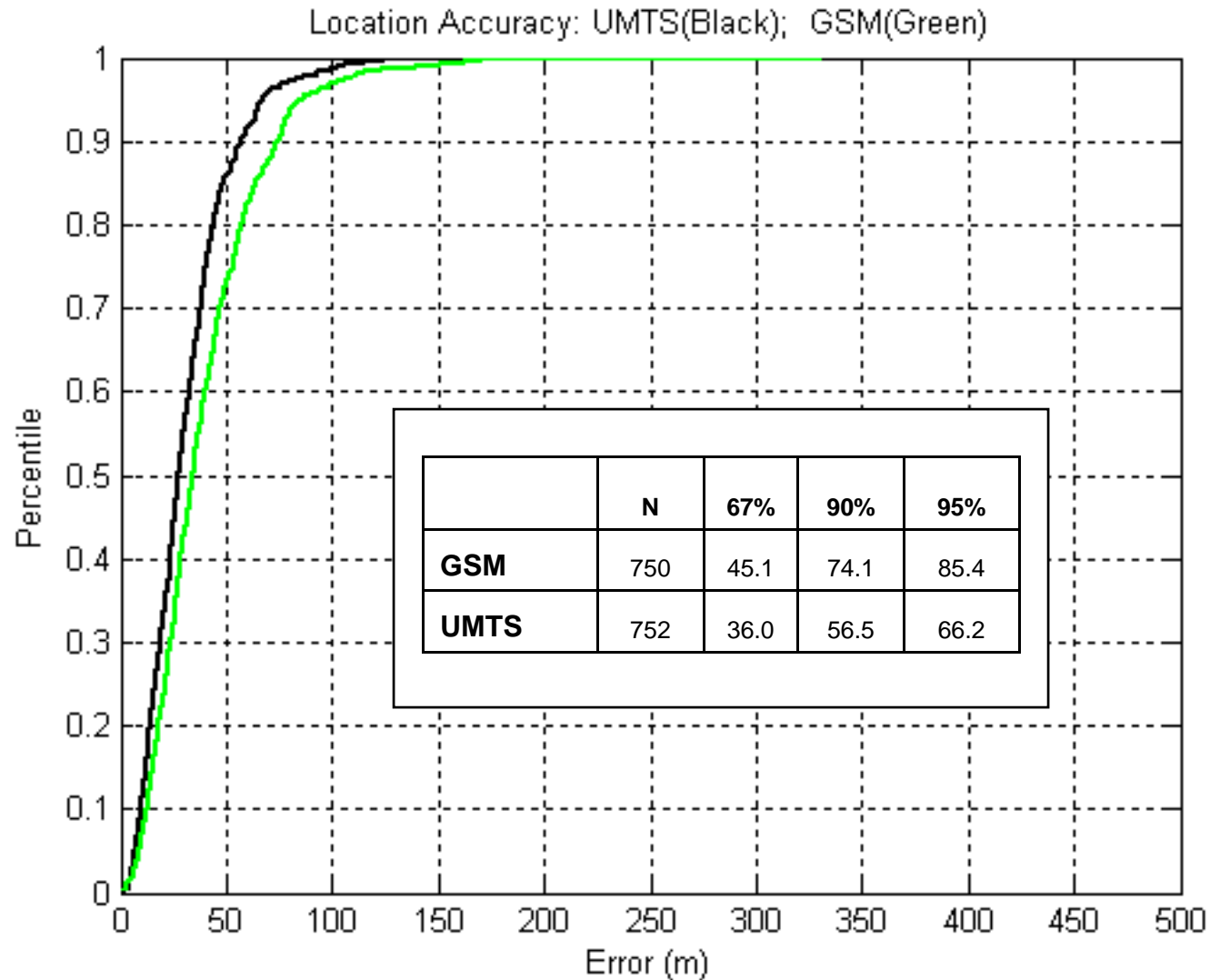
# Hybrid Analysis



# Summary Results

	Technology	N	67% (m)	90% (m)	95% (m)
<b>All Locations</b>	<b>AGPS/RTT</b>	752	36.0	1081.0	1442.5
	<b>UTDOA</b>	752	36.0	56.5	66.6
	<b>Hybrid</b>	752	19.8	46.7	58.6
<b>Outdoor Locations</b>	<b>AGPS/RTT</b>	500	13.1	26.3	41.6
	<b>UTDOA</b>	500	34.4	52.0	63.2
	<b>Hybrid</b>	500	13.4	23.6	30.8
<b>Indoor Locations</b>	<b>AGPS/RTT</b>	252	1076.7	1451.8	1466.2
	<b>UTDOA</b>	252	39.8	64.8	75.0
	<b>Hybrid</b>	252	40.5	65.0	74.6

# UTDOA - GSM vs. UMTS





# Accuracy Results Analysis

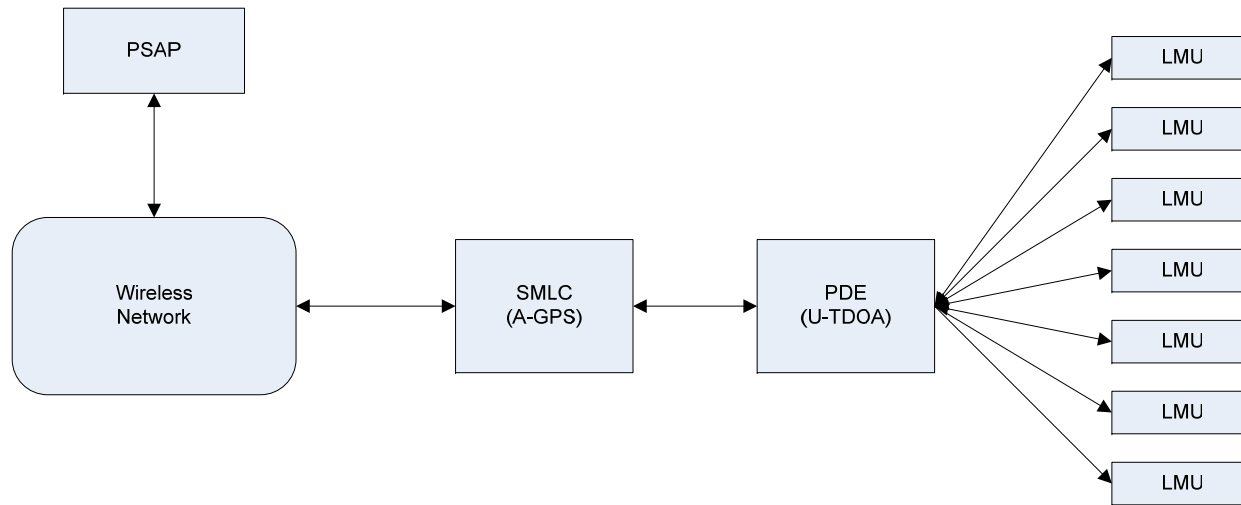
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- A-GPS performs well in outdoor environments with adequate line-of-sight to satellites.
- U-TDOA work well outdoors and maintains its accuracy in indoor environments, as well as dense urban areas.
- Combining A-GPS in unobstructed environments with the complementary high accuracy of U-TDOA in urban and suburban indoor environments will provide “best of both worlds” solution.

Hybrid solution creates an improved location solution with enhanced accuracy and yield.

# Proven Solution Exists Today

- Hybrid solution using two proven technologies is available today
  - U-TDOA equipment already deployed in many networks
  - AGPS capable handsets being aggressively rolled out



- SMLC currently chooses to EITHER perform an A-GPS location OR request a U-TDOA location from the PDE
- Relatively minor software change in SMLC logic to perform BOTH an A-GPS location AND request a U-TDOA location from the PDE is all that is needed to realize the benefits of a Hybrid solution

# Conclusion

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- Locating wireless 9-1-1 calls indoors remains a growing problem
- Solutions using proven technologies exist today
- Indoor accuracy requirements can be independent of current outdoor requirements
  - No need to establish precise percentage of indoor/outdoor calls
- Testing methods to minimize ongoing costs should be considered
  - Type testing of buildings and environments
  - Baseline testing followed by sub-sampling of test points for maintenance
- Accurate indoor and outdoor location capability should be an integral part of Next Gen 911



# Conclusion

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- FCC should move forward with indoor location requirements
  - Current situation is similar to what existed in 2001
  - Technological solutions exist today
  - Awaiting industry consensus prior to making rules will simply delay the process
  - CSRIC test bed idea is a good concept, but may take significant time to implement

**FCC requirements will motivate carriers to evaluate options and deploy the best solutions – Similar to what occurred (very successfully) during the original Phase II implementation process**